

POSITIONS AND AREAS OF SUN SPOTS

[Communicated by Capt. J. F. Hellweg, U. S. Navy (Ret.) Superintendent, U. S. Naval Observatory. Data from measurements at the U. S. Naval Observatory from plates obtained at the observatories indicated. Difference in longitude is measured from the central meridian, positive toward the west. Latitude is positive toward the north. Areas are corrected for foreshortening and expressed in millions of Sun's hemisphere. For each day below longitude, latitude, area of spot or groups, and spot count, are given respectively the assumed longitude of the center of the disk, assumed latitude of the center of the disk, total area of spots and groups, and total spot count]

Date	Eastern standard time	Mount Wilson group No.	Heliographic				Observatory	Date	Eastern standard time	Mount Wilson group No.	Heliographic				Area of spot or group	Spot count	Plate quality	Observatory			
			Difference in longitude	Longitude	Latitude	Distance from center of disk					Area of spot or group	Spot count	Plate quality								
1940	h m		o	o	o	o		1940	Jan. 16...	h m	6735	o	o	o							
Jan. 1...	11 44	6725	-52	118	+11	53	73	4		13 31	6736	-79	253	-17	79	12	1	VG	U. S. Naval.		
		6723	-41	129	+17	44	145	2			6736	-78	254	-11	78	12	1				
		6716	+76	246	-12	76	145	5			6736	-60	272	-7	60	24	3				
				(170)	(-3)						6734	-46	286	-19	48	97	14				
							363	11			6730	0	332	-9	4	291	44				
											6733	+9	341	-13	12	48	11				
													(332)	(-5)		484	74				
Jan. 2...	10 54	6725	-39	119	+11	40	194	8	G	U. S. Naval.	Jan. 17...	18 10	6736	-65	254	-11	65	24	1	G	Do.
		6723	-27	131	+17	34	73	2			6735	-62	257	-15	63	24	2				
		6724	-26	132	+9	27	61	2			6734	-32	287	-19	35	242	10				
		6726	-11	147	-7	12	12	2			6737	-18	318	-11	6	48	4				
				(158)	(-3)						6730	+12	331	-10	13	376	20				
							340	14			6733	+22	341	-12	23	12	4				
													(319)	(-5)		726	41				
Jan. 3...	11 10	6725	-25	119	+11	27	485	35	G	Do.	Jan. 18...	18 39	6736	-49	254	-12	50	24	1	P	Mt. Wilson.
		6723	-18	129	+18	25	73	3			6735	-44	259	-15	45	24	2				
		6724	-12	132	+9	17	97	11			6734	-17	288	-20	23	242	20				
		6726	+4	148	-5	7	24	2			6737	+17	320	-12	19	12	2				
				(144)	(-3)						6730	+27	330	-10	28	339	14				
							679	51					(303)	(-5)		641	39				
Jan. 4...	10 52	6727	-60	71	+19	61	24	1	P	Do.	Jan. 19...	11 16	(*)	-42	252	-18	44	12	4	G	Do.
		6725	-12	119	+11	17	1857	40			6736	-38	256	-12	39	24	2				
		6723	-2	129	+19	21	121	11			6735	-34	260	-15	30	24	3				
		6724	+1	132	+10	12	97	10			6734	-18	276	-20	24	194	28				
				(181)	(-3)						6739	-9	285	+14	21	97	11				
							1899	62			6738	+40	334	-10	41	242	25				
													(294)	(-5)		593	73				
Jan. 5...	11 43	6727	-46	72	+19	50	24	1	G	Do.	Jan. 20...	11 15	6740	-77	203	-6	77	24	1	VG	U. S. Naval.
		6725	+4	122	+11	14	2279	40			6736	-28	258	-11	26	6	3				
		6723	+11	120	+18	23	97	7			6735	-22	258	-15	25	48	10				
		6724	+17	135	+10	21	97	5			6739	-12	268	-11	14	121	9				
				(118)	(-3)						6738	+4	284	+14	19	73	9				
							2497	53			6734	+5	285	-19	16	145	17				
											6730	+50	330	-10	50	73	4				
													(280)	(-5)		490	58				
Jan. 6...	10 50	6725	+17	122	+11	21	2827	38	G	Do.	Jan. 21...	12 6	6740	-63	204	-5	63	12	2	F	Do.
		6723	+24	129	+18	31	73	3			6735	-11	256	-15	15	48	3				
		6724	+28	133	+10	30	97	5			6739	+2	269	-10	6	145	9				
				(105)	(-4)						6738	+17	284	+14	25	97	6				
							2497	46			6734	+17	284	-19	22	145	12				
													(267)	(-5)		447	32				
Jan. 9...	10 47	6728	-5	60	-8	8	73	9	VG	Do.	Jan. 22...	11 22	6740	-51	203	-5	51	48	7	G	Do.
		(*)	+20	85	+21	31	109	8			6735	+2	256	-15	11	24	1				
		(*)	+30	95	+19	37	12	1			6739	+11	265	-9	13	73	9				
		6726	+68	123	+11	60	2230	30			6738	+18	272	-9	12	73	10				
				(65)	(-4)						6734	+28	282	-19	31	24	2				
							2424	48					(267)	(-5)		447	32				
Jan. 10...	11 34	6728	+9	61	-8	10	48	12	VG	Do.	Jan. 23...	11 22	6740	-51	203	-5	51	48	7	G	Do.
		(*)	+33	86	+21	41	48	3			6735	+2	256	-15	11	24	1				
		6725	+71	123	+11	73	1988	15			6739	+11	265	-9	13	73	9				
				(52)	(-4)						6738	+18	272	-9	12	73	10				
							2084	30			6734	+28	282	-19	31	24	2				
													(254)	(-5)		315	30				
Jan. 12...	12 28	6730	-52	333	-10	53	97	6	F	Mt. Wilson.	Jan. 24...	12 24	6740	-20	207	-5	20	48	7	VG	Do.
		6729	-26	359	+15	32	24	3			6735	+28	255	-14	29	12	8				
		6728	+38	63	-8	39	73	10			6735	+30	257	-15	32	242	16				
				(25)	(-4)						6739	+44	271	-9	44	133	5				
							194	19					(254)	(-5)		435	36				
Jan. 13...	11 41	6730	-40	332	-10	41	145	22	G	Do.	Jan. 25...	10 56	6740	-13	202	-7	13	24	2	F	Do.
		6733	-31	341	-12	32	12	3			6740	-6	209	-7	6	24	2				
		6732	+21	33	-17	24	12	2			6735	+48	263	-14	49	194	6				
		6731	+28	40	+8	31	18	2			6739	+58	273	-10	58	97	1				
		6728	+51	63	-8	51	121	16					(227)	(-5)		339	11				
				(12)	(-4)											1066	23				
Jan. 14...	11 27	6730	-27	332	-10	28	242	21	G	Do.	Jan. 26...	11 6	6741	-74	127	+12	76	679	7	G	Do.
		6733	-18	341	-13	20	73	7			6740	+6	207	-7	6	97	11				
		6732	+36	35	-18	39	6	1			6735	+63	264	-14	64	242	4				
		6731	+40	39	+8	42	6	1			6739	+70	271	-10	70	48	1				
		6728	+64	63	-8	64	170	23					(201)	(-6)		1066	23				
				(359)	(-5)											1769	44				
Jan. 15...	11 32	(*)	-70	276	+26	75	24	2	F	U. S. Naval.	Jan. 27...	10 41	6741	-78	111	+12	80	630	7	VG	Do.
		6734	-60	286	-19	61	48	9			6741	-61	128	+11	63	776	16				
		6730	-13	333	-9	14	242	32			6740	+19	208	-7	19	73	11				
		6733	-5	341	-13	10	48	7			6735	+76	265	-14	76	242	9				
		6728	+78	64	-8	78	121	12			6739	+84	273	-11	84	48	1				
				(346)	(-5)								(180)	(-6)		1769	44				

POSITIONS AND AREAS OF SUN SPOTS—Continued

Date	Eastern standard time	Mount Wilson group No.	Heliographic					Spot count	Plate quality	Observatory
			Difference in longitude	Longitude	Latitude	Distance from center of disk	Area of spot or group			
1940 Jan. 28	h m 11 10	6741 6741 6740	-64 -47 +33	111 128 208	+12 +11 -7	66 50 33	630 776 97	10 12 10	G	U. S. Naval
				(175)	(-6)		1503	32		
Jan. 29	11 14	6741 6741 6740	-49 -32 +47	113 130 209	+12 +11 -7	52 36 47	630 776 97	10 17 10	G	Do.
				(162)	(-6)		1503	37		
Jan. 30	14 50	6742 6743 6741 6741 6740	-76 -75 -34 -18 +61	71 72 113 129 208	+7 -24 +12 +11 -7	76 76 38 25 61	388 97 533 679 48	2 1 6 7 1	P	Do.
				(147)	(-6)		1745	17		
Jan. 31	13 10	(*) 6743 6742 6743 6741 6741	-73 -68 -62 -61 -21 -5	62 67 73 74 114 130	-8 -23 -7 -24 +12 +11	73 68 62 63 27 17	12 12 242 121 523 675	1 1 2 1 15 8	VG	Do.
				(135)	(-6)		1599	28		

Mean daily area for 27 days = 1023.

*=not numbered

VG=very good; G=good; F=fair; P=poor.

PROVISIONAL SUNSPOT RELATIVE NUMBERS FOR JANUARY 1940

[Dependent alone on observations at Zurich]

[Data furnished through the courtesy of Prof. W. Brunner, Eidgen. Sternwarte, Zurich, Switzerland]

January 1940	Relative numbers	January 1940	Relative numbers	January 1940	Relative numbers
1-----	<i>Ec</i> 39	11-----	<i>Ec</i> 50	21-----	<i>a</i> 71
2-----	37	12-----	29	22-----	* 75
3-----	42	13-----	34	23-----	52
4-----	--	14-----	61	24-----	34
5-----	<i>b</i> --	15-----	* <i>Ec</i> 33	25-----	<i>d</i> --
6-----	* 55	16-----	<i>a</i> 61	26-----	* 54
7-----	--	17-----	--	27-----	
8-----	38	18-----	64	28-----	
9-----	--	19-----	59	29-----	
10-----	41	20-----	<i>Mac</i> 88	30-----	

Mean, 20 days = 50.9.

* Observed at Chur.

a=Passage of an average-sized group through the central meridian.*b*=Passage of a large group through the central meridian.*c*=New formation of a group developing into a middle-sized or large center of activity: E, on the eastern part of the sun's disk; W, on the western part; M, in the central-circle zone.*d*=Entrance of a large or average-sized center of activity on the east limb.

AEROLOGICAL OBSERVATIONS

[Aerological Division, D. M. LITTLE, in charge]

By B. FRANCIS DASHIELL

The lowest mean free-air pressures for January prevailed over northeastern Canada (Newfoundland Airport, 48°58' N., 54°35' W.), Sault Ste. Marie, Mich., and Fairbanks, Alaska, at all levels (charts VIII, IX, X, and XI). Highest mean pressure occurred in the South, being centered over Miami, Fla. However, at 5,000 feet (chart VIII), pressure was slightly highest over the Rocky Mountain region (southern Colorado). During the current month the Alaskan mean pressures were higher than those recorded in any preceding month. Also, the Fairbanks, Alaska, pressures, which heretofore have been lower than those observed at Sault Ste. Marie, Mich., were higher during January.

The pressure gradient between the regions of high and low pressures (Miami, Fla., and Sault Ste. Marie, Mich., respectively) increased steadily with altitude up to 8 kilometers, and then slowly diminished. This gradient showed a mean difference of 9, 18, 27, 35, 39, 35, 29, and 20 millibars at 0.5, 1.5, 3, 5, 8, 10, 12, and 14 kilometers, respectively.

The persistence of outstanding low-surface temperatures during January was reflected by the minimum mean free-air temperatures (°C.) recorded by radiosondes and airplanes. Lowest mean temperatures occurred over Sault Ste. Marie, Mich., in all levels up to 9 kilometers; then over Bismarck, N. Dak., at 10 kilometers; Boise, Idaho, and Oklahoma City, Okla., at 11 kilometers; Medford, Oreg., at 12 kilometers; and Miami, Fla., at 14, 15, 16, 17, 18, and 19 kilometers. A low mean temperature of -74.2°C. was noted over Miami, Fla., at 17 kilometers. Highest mean temperatures occurred also over Miami,

Fla., in all lower levels up to 11 kilometers; then over Joliet, Ill., at 12, 13, 14, and 15 kilometers; and over Nashville, Tenn., at 16 and 17 kilometers. Alaskan mean temperatures were warmer than those recorded at several stations within the United States proper. Up to 9 kilometers, Sault Ste. Marie, Mich., averaged about 4°C. colder than Fairbanks, Alaska, at all levels.

Mean temperatures were colder than those occurring in all previous months of record, even at those stations with 18 months of radiosonde observations. This condition persisted up to 11 kilometers, but above that level January was generally warmer than most previous months. Comparing January with the corresponding month of 1939 at those stations having a complete year of radiosonde observations, it was found that the current month was colder over all portions of the country except the western slope of the Rockies. The greatest tendency toward lower 1940 temperatures occurred over the northern and eastern portions of the United States during January.

Individual minimum temperatures were lowest over the far South and West, with the extremes occurring at Miami, Fla. (-78.0°C.), El Paso, Texas (-76.1°C.), Phoenix, Ariz. (-75.0°C.), San Diego, Calif. (-72.0°C.), and Medford, Oreg. (-72.0°C.). However, these individual temperatures were generally warmer than extreme minimum temperatures recorded during previous months at altitudes ranging from 16 to 18 kilometers.

The levels of mean freezing temperatures (0°C.) in the free air ranged from a surface line reaching from North Carolina, Alabama, Oklahoma, Arizona, Nevada, and Washington, to altitudes of 3,710 meters over Miami,